

***ATRICHOPOGON (MELOEHELEA) WINNERTZI* GOETGHEBUER  
(DIPTERA: CERATOPOGONIDAE) FEEDING ON *MELOE  
VIOLACEUS* MARSHAM (COLEOPTERA: MELOIDAE)**

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Members of the biting midge genus *Atrichopogon* Kieffer, subgenus *Meloethelea* Wirth (Diptera: Ceratopogonidae) are well known to feed on adult meloid and oedemerid beetles (Coleoptera: Meloidae & Oedemeridae). The subgenus was erected by Wirth (1956) to include four species, which are characterised by their beetle-feeding behaviour and their unusually adapted proboscis, which is up-curved, presumably developed for their peculiar feeding habit. The subgenus currently contains seven species (Wirth, 1980), of which three are known to occur in Britain (Chandler, 1998) viz.: *lucorum* (Meigen); *oedemerarum* Storå, *winnertzi* Goetghebuer, (= *meloesugaus* Kieffer, of earlier workers e.g. Cooter & Irwin, 1979; Wirth, 1956, 1980. See Szadziewski *et al.*, 1995 for synonymy). All of the species of this subgenus so far known have been recorded to feed on the haemolymph of adult beetles in the families Meloidae and Oedemeridae.

The flies are attracted by the cantharidin produced by these beetles as part of their defence system (e.g. Abdullah, 1964; Bologna & Havelka, 1984; Frenzel *et al.*, 1992; Frenzel & Dettner, 1994). In experiments Abdullah (*op. cit.*) found that *A. oedemerarum* (in Berkshire, England) and *A. lucorum* (in Scotland) (*teste* Wirth, 1980) were attracted to cantharidin powder placed in Petri dishes. The attractiveness of cantharidin to these flies in the absence of the beetle hosts has also been noted by others (e.g. Frenzel *et al.*, 1992). The list of ceratopogonids attracted to cantharidin is in the region of 20 species, of which all but two are in the genus *Atrichopogon* (Hemp & Dettner, 2001). However the sub-generic placement for the majority of species in this large genus (391 spp. *teste* Borkent & Wirth, 1997) has yet to be resolved, and in the World catalogue species are not separated by subgenera (Borkent & Wirth, 1997). However, it is unlikely that all of these eighteen *Atrichopogon* species recorded as being attracted to cantharidin will be in the subgenus *Meloethelea*. The function of the attraction to and the feeding on cantharidin by these flies is still not fully understood (Frenzel & Dettner, 1994). However, it is possible that the cantharidin may be used in some function of mate attraction, since males are often attracted to cantharidin-baited traps although they generally feed on nectar. It is also possible that the cantharidin may serve as a chemical defence to deter predators such as empid flies (Empididae), as was shown by Frenzel & Dettner (1994).

A large number of insect species have been recorded as being attracted to cantharidin; these so-called canthariphilous insects are listed in Hemp & Dettner (*op. cit.*). The ant beetles (Anthicidae) are by far the largest group in terms of number of species with some 182 species being recorded as canthariphilous. Other families of canthariphilous Coleoptera include: Endomychidae, Pyrochroidae and Tomoderidae. In the Hemiptera; Lygaeidae and Miridae and in the Diptera, besides the Ceratopogonidae mentioned above, some Anthomyiidae, Cecidomyiidae and Sciaridae are canthariphilous.

The first observation of ceratopogonid flies feeding on meloid beetles was made by de Peyerimhoff (1917), who discovered a female fly feeding on *Meloe megalis* L. in Algeria. This species was later described by Kieffer (1922) as *meloengans* (= *winnertzi*). However, since then, little has been published on this behaviour (see Wirth, 1956, 1980; Hemp & Dettner, 2001 and references therein). The first account of this behaviour in Britain was published by Blair (1937, 1938), who reported *A. meloengans* feeding on both *M. proscarabaens* L. and *M. violaceus* Marsham in south Devon. Wirth (1980) has since examined some of Blair's material of *meloengans* and re-determined it as *A. lucorum*. To date there are only a few accounts of this behaviour in Britain (e.g. Blair, 1937, 1938; Cooter & Irwin, 1979). A summary of the published records of *Atrichopogon* species feeding on *Meloe* beetles in Britain is given below.

<i>Atrichopogon (Melochelea) spp.</i>	<i>Meloe spp. attacked</i>	Source
<i>A. (M) winnertzi</i> Goetghebuer	<i>M. violaceus</i> Marsham	Cooter & Irwin, 1979; Mann & Turner, this paper

In south Devon, in recent years, *M. violaceus* has been encountered relatively frequently, usually on roadsides and along typical "Devon walls". Characteristically for *Meloe*, adults were only observed on bright sunny days in early summer, frequently on shaded woodland paths and roadsides. On one occasion a female *violaceus* was observed on a footpath in a ca. 2.5 m wide track between two "Devon walls" at Brent Tor, Dartmoor (SX480806; VC 03; 26.iv.1997. coll. C.R. Turner & D. Bilton). It was not the observation of the beetle that caused surprise but rather the small cloud of minute black flies above the beetle. On closer inspection some of these flies were observed to aggregate around the beetle, flying in a small group and occasionally alighting on or flying from the abdominal segments. The cloud of flies followed in a close plume behind the beetle as it moved. A small number of these flies remained stationary on the upper surface of the abdomen, despite the jerking movement caused by the characteristic clumsy gait of the *Meloe*. Closer inspection of the flies on the abdomen left little doubt that they were feeding on the beetle, mostly around the marginal joints of the tergites, where they appeared to be manipulating their heads against the softer cuticle around the inter-segmental membranes.

The *Meloe* was placed in a tube, along with three of the feeding flies that were later identified as female *Atrichopogon winnertzi* Goetghebuer (Diptera: Ceratopogonidae) by John Boorman. Voucher specimens of these flies are now housed in the Hope Entomological Collections (HEC).

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## SHORT COMMUNICATION

**An observation of the prey species of the solitary wasp, *Ectemnius cavifrons* (Hymenoptera: Sphecidae)**—In August 2002 a colony of *Ectemnius cavifrons* (Thomson) was found to be established in timbers infested with *Exidia glandulosa* (St. Amans) Fries, Witches' Butter Fungus, on the roof of a central Edinburgh building (O.S. Grid NT2573; v.c. 83). When the wasps were manocuvring their prey into the entrance of their prepared tunnel they occasionally dropped it. They seemed unable to retrieve the dropped prey, possibly due to its absence of movement. Some individual wasps were more prone to dropping their prey than others. As a result a substantial sample of prey items of *E. cavifrons* was able to be collected and identified without interfering with the colony. Of the 58 prey items retrieved from below the tunnel entrances, approximately 83% consisted of hoverflies (Syrphidae) (namely 13 *Episyrphus balteatus* (De Geer), 12 *Syrphus ribesii* (L.), 6 *S. vitripennis* Meigen, 6 *S. torvus* Osten Sacken, 5 *Eupeodes corollae* (Fabricius), 4 *E. latifasciatus* (Macquart) and 2 *E. luniger* (Meigen)), 16% consisted of calliphorid flies (namely 5 *Pollenia rudis* (Fabricius) 4 *Calliphora vicina* Robineau-Desvoidy) and a single cicadellid homopteran, *Iassus latio* (L.). I am grateful to David Robertson for identifying the calliphorid flies.—K. P. BLAND, National Museums of Scotland, Chambers Street, Edinburgh, EH1 1JF